THE DOE RUN COMPANY

SMELTING DIVISION

April 1, 2002

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Site: Herculaneum
ID #: MOD006266377
Break: 2.0
Other:
SRC 4-1-02

Mr. Anthony Petruska
Project Manager
Air, RCRA, and Toxics Division
US EPA, Region VII
801 North 5th Street
Kansas City, Kansas 63048

Re: The Doe Run Herculaneum Smelter Transportation and Materials Handling Plan

Dear Mr. Petruska:

Please find enclosed the revised report of "The Doe Run Herculaneum Smelter Transportation Plan and Materials Handling Plan." The Doe Run Company has made every effort to address the comments and concerns that have been raised during the review of the initial plan. The initial plan has been completely revised and expanded to incorporate detailed responses to the expressed concerns.

The transportation plan identifies transportation activities to and from the smelter that have the potential for tracking lead contamination out of the plant. The materials handling plan identifies in-plant materials handling activities that have the potential for creating fugitive lead contaminant emissions from the plant or increasing the potential for the tracking of lead contamination from the plant. Descriptions of existing structural controls and best management practices, in addition to the proposed changes to minimize the potential for tracking and fugitive emissions, are included in the plans.

The plan identifies several proposed structural controls and best management practices that are currently being evaluated by Doe Run. A decision on the feasibility of some of the proposals under consideration, and actual implementation of those determined to be feasible could not be completed in time for completion of this report. In addition, the feasibility of some of the proposals is contingent upon the final plan as approved by the EPA. Doe Run proposes to submit a schedule for finalizing decisions and implementations of the proposed structural controls and best management practices within 30 days of the EPA's approval of the transportation plan and materials handling plan.

The plan includes descriptions of work procedures for the described best management practices as Appendix B and copies of various records; certificates and inspection forms associated with the described best management practices as Appendix C. Detailed work procedures are currently being written to be included in Appendix B. Some of the documents to be included in Appendix C, such as certification forms, are currently being utilized. However, these documents are being re-evaluated as a result of the revised plan. These revised documents and other forms required for Appendix C are being developed. A schedule to complete these documents for inclusion in the plan, as appendices,

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will be included in the aforementioned schedule to be submitted within 30 days of the EPA's approval of the plan.

Doe Run respectfully requests a quick review of the transportation plan and materials handling plan in an effort to expedite approval and implementation of the plans. If you have any questions, please feel free to contact me at (636) 933-3180.

Sincerely,

Aaron W. Miller

Aaron W. Miller
Environmental Manager of Primary Smelting
The Doe Run Company

Enclosure(s)

cc: David E. Mosby, Missouri Department of Natural Resources
John Doyle, Barr Engineering
Clifton W. Gray, The Doe Run Company

The Doe Run Herculaneum Smelter Transportation Plan and Materials Handling Plan

THE DOE RUN COMPANY

Herculaneum, Missouri

April 2002

BARR

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The Doe Run Herculaneum Smelter
Transportation Plan
and
Materials Handling Plan

The Doe Run Company
April 2002

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1.0 Executive Summary

The Doe Run Company (DRC) Herculaneum facility (Doe Run) processes or smelts raw lead-bearing concentrate along with other metallurgical reagent materials into lead alloys. The toxicity of the materials, specifically lead, handled at this facility is a major concern for everyone working at this facility. The safety and health of DRC personnel, residents of Herculaneum, and protection of the environment are of primary concern to Doe Run. DRC currently has procedures in place to minimize potential migration of lead-bearing materials from the plant. These procedures have been re-evaluated as part of the development of The Doe Run Herculaneum Smelter Transportation Plan and Materials Handling Plan. This plan incorporates an explanation of existing procedures and new plans for control measures to reduce the potential impact the facility has on human health and the environment. The plan addresses two major areas of concern; transportation to and from the facility that has the potential for releasing lead contaminants to the surrounding area and materials handling within the plant that has the potential for generating fugitive emissions of lead contaminants. The transportation plan is organized into three sub-plans; transportation by truck, rail, and barge. The transportation plan identifies the inbound and outbound materials followed by existing and proposed structural controls and best management practices to control potential contaminants during transportation. The materials handling plan describes material management within the plant and plans to control potential fugitive emissions. Each plan specifies additional proposed structural controls and/or best management practices where appropriate and necessary.

Enclosed in this plan are the included items that are new or proposed to be new.

1. Designation of red and green zones within and around the plant.
2. Establishment of additional new wash stations.
3. All slag removed from plant by rail in lieu of truck transport to the slag storage area.
4. Second south storage area truck unloading station.
5. Dross storage within a building.
6. New wetting system for materials handling.
7. New materials storage and handling procedures.

8. Selection of a new haul route to plant.

9. Transload station at Glover.

10. Covers for rail cars.

Areas within and adjacent to the plant are classified as "red" or "green" zones. The "red" zones are internal to the plant and considered the highest potential to be contaminated. "Green" zones are external to the lead-bearing materials handling areas and are considered the least potential to be contaminated. Transition areas between the "red" and "green" zones are designated as "blue" zones and are truck and/or equipment cleaning areas. All truck traffic that has been within the "red" zone will be cleaned prior to transitioning into the "green" zone. The paved areas and roadways within the "red" zone are cleaned with wet sweepers and other cleaning methods on a daily basis. The designated roadways within the "green" zone will be cleaned with a dry sweeper on a daily basis to keep the road surface clean. Utilization of alternate ingress and egress routes to the plant is also being evaluated in an effort to minimize or eliminate truck traffic through residential areas.

The materials handling plan has been developed to minimize the storage of lead-bearing materials outdoors, with controls implemented for material stored outdoors to minimize the potential for fugitive emissions. The Doe Run Company's goal is to have all lead-bearing materials that have the potential to generate fugitive emissions stored within buildings or covered containers.

Doe Run is working to implement the rail transportation of lead concentrate as quickly as possible. However, barge transportation of lead concentrate or other lead-bearing materials is not currently being utilized, nor are there plans to utilize barge hauling of concentrate in the immediate future. The barge transportation plan will be updated and incorporated in this overall plan prior to the use of the barge unloading facility to transfer lead concentrate or lead-bearing materials.

Development and implementation of the transportation and materials handling plan is one of many steps Doe Run has taken recently to address offsite migration of lead contaminants and to minimize the potential for future migration of lead contaminants from the plant.

Doe Run intends to implement an ISO 14000 environmental management system at the Herculaneum facility within the next two years and is fully committed to the successful implementation of this transportation and materials handling plan. The Doe Run environmental management team will review this plan annually to determine its effectiveness. The review will include areas that could be improved and new activities that need to be included in this plan. The review will also include a

summary of action items, the name of the person responsible for completing each action item, and a target completion date for each action item.

2.0 Introduction

The general layout of The Doe Run Herculaneum Smelter plant is shown on Figure 1. The plant and the adjoining area is subdivided into red and green zones dependant upon the area's potential for lead contamination as illustrated on Figure 2, with the red zone as the area with the highest potential exposure for lead. The Occupational Safety and Health Administration (OSHA) regulations are applicable to the DRC Herculaneum facility. Personnel working in the red zone are required to meet specific OSHA training, testing, and personal protective equipment (PPE) requirements. DRC personnel operating the truck wash areas are considered to be inside the red zone. Level C protection, hard hat, steel toe boots, safety glasses, and DRC issued coveralls with a standard half or full air purifying respirator or a powered air purifying respirator is the standard level of protection inside the red zone. All employees working within the red zone are required to change from their street clothes into work clothes provided by Doe Run in the clean locker room. When employees leave the red zone, they turn in the work clothes for laundering by Doe Run and are required to shower prior to entering the clean locker room and changing back into their street clothes.

In addition to employee protection procedures, protocols have also been developed for vehicles entering and leaving the red zone. There are three points of access into the red zone as illustrated in Figures 1 and 2. These points of access are the main entrance, the south storage area entrance, and the east storage area entrance. Each of these entrances is currently provided, or will be provided, with a vehicle wash/cleaning station. Vehicles are only allowed to transition into or out of the red zone through one of these points. Information regarding structural and nonstructural control measures for each transition area is provided in Section 3.1.

The transportation plan identifies the materials brought into and out of the plant and their methods of transportation, and addresses controls and measures for minimizing the potential for tracking or spilling lead contaminants onto the public roadways. The materials handling plan identifies relevant materials handled within the plant and addresses controls and measures for minimizing the potential for fugitive emissions associated with storage and movement of lead-bearing materials within the plant. Proposed structural controls and best management practices to minimize potential for tracking and fugitive emissions of lead contaminants are included in the plan. Some of the terms used in the plan can be found in the glossary included as Appendix A.

3.0 Truck Transportation Plan

3.1 Plant

All inbound and outbound trucks transporting lead-bearing materials to and from the plant are required to follow one of two designated road systems through the town of Herculaneum. The designated routes start at Highway 61/67 (Commercial Blvd.) and proceed east to the plant as shown on Figure 3. The first designated route starts from Highway 61/67 and proceeds along Joachim Avenue to Main Street and on to the plant. The second designated route starts at the intersections of Highway 61/67 and either Scenic Drive or Joachim Avenue and proceeds along Joachim Avenue to Brown Street, to Station Street, to Main Street at the plant. A description of lead-bearing and nonlead-bearing materials that enter and exit the plant by truck transport is provided below. The locations of the deliveries can be found in Figures 1 and 5.

3.1.1 Inbound Materials

3.1.1.1 Lead Concentrate and Lead-Bearing Materials

Lead Concentrate: Ore-containing lead is concentrated at the mine/mill facilities. The lead concentrate contains approximately 75 to 80 percent lead with a moisture content of approximately 7 to 8 percent. As a result of the concentrate being damp, it cakes together, which reduces the potential for the concentrate to create an airborne dust.

The concentrate is hauled from the mine to the plant by tractor-trailer. The trailer units are open-top end-dump box units. The trailers are covered with non-porous tarps in good condition. The tarps extend over the sides and ends of the trailer and are tightly strapped in place, thereby providing a tight cover over the box unit. Because of the high density of the lead concentrate, the weight limit of a loaded trailer is reached before the volume capacity of the trailer if fully utilized. Typically, the loads occupy only about 25 percent of the total volume of the trailer, reducing the potential for concentrate spillage along the tarp-trailer interface during transport and the tarp installation/removal activities.

Approximately 230 trucks per week are received at the Herculaneum smelter at the current production rate of 155,000 tons per year. Approximately 320 trucks per week would be received at the maximum production rate of 250,000 tons per year. Concentrate trucks are normally received between 6 a.m. and 6 p.m., Monday through Friday. All concentrate trucks are unloaded at the new

concentrate truck unloading facility north of the strip mill building (see Figure 1) and do not enter the red zone.

Lead-Bearing Materials: Non-bulk lead-bearing materials consisting of glass, circuit boards, blast grit, brass buffings and other electronic components containing lead are delivered by truck to the plant and are packaged in sift-proof cubic yard boxes, super sacks, and 55-gallon drums. Doe Run receives approximately eight truckloads of this material per month. These materials are delivered at the strip mill building truck dock and unloaded. The delivery trucks do not enter the red zone. The lead contained in the these materials is encapsulated or otherwise packaged in a form that is more easily managed and presents little potential for contributing to fugitive emissions of lead contaminants, or negatively impacting human health or the environment. DRC personnel and equipment transfer the pallets and palletized materials onto a box rail car at the strip mill siding. The DRC engine moves the rail car to the south storage area outside dock where the material is unloaded, unpackaged, and stored in the south storage area until utilized in the smelting process.

Palletized fine or siftable materials that have the potential to generate fugitive dust emissions are transferred directly to the rail car unloader area where they are unpackaged and the contents fed directly into the grizzly screen on the north side of the rail car unloader. The associated packaging is then recycled as a flux in the dross kettles.

Doe Run receives two to three truckloads per month of bulk lead-bearing flux material at the plant. The material consists of either firing range soils with bullets or leaded glass. The lead within the bulk material is either lead bullets within the soil or else encapsulated within the glass. The trucks enter the red zone of the plant through the south plant entrance and unload the material on a storage pad in the south storage area. These trucks present a moderate to high potential for tracking lead contaminants from the plant.

3.1.1.2 Nonlead-Bearing Materials

The primary concern with inbound nonlead-bearing materials is the truck traffic in and out of the plant and the potential for tracking of lead contaminants offsite. As part of the effort to identify and manage the overall plant traffic, this section identifies inbound nonlead-bearing material deliveries and their associated potential for tracking lead is estimated based on the areas of the plant where the delivery is made.

Oxygen

Liquid oxygen to supplement onsite production is delivered to the plant by truck. The trucks are brought in the front gate and directed through the main yard to the liquid oxygen storage tanks. The oxygen tanks/production tanks are located near the front entrance but within the red zone, just east and south of the store room/main shop building (see Figure 1). Approximately four to five bulk oxygen deliveries are made to the plant per month, and these deliveries present a low to moderate potential for tracking lead-bearing materials. (See Figure 1.)

Fuel Oil

Fuel oil, primarily diesel No. 2, and gasoline are delivered to the plant by truck. Approximately 12 trucks per month are delivered between 7 a.m. to 7 p.m., Monday through Friday. The delivery truck fuels various mobile equipment and storage tanks within the red zone in the plant. Fuel oil truck traffic presents a moderate to high potential for tracking lead-bearing materials.

Coke

Coke and coke breeze is a by-product carbon material from petroleum refining. Carbon is a metallurgical component as well as a fuel source. The current vendor utilized by Doe Run delivers approximately 45 truckloads of coke and 16 truckloads of coke breeze per month to the plant between 7 a.m. to 7 p.m. This material is delivered to the plant and is routed directly to the storage areas on the north end of the plant (see Figure 5). The storage areas are within the red zone of the plant and the delivery trucks present a moderate to high potential for tracking lead-bearing materials.

Fluxes and Substitutes

Fluxes and substitutes (limestone, sand, iron mill scale, and additional coke material) that are used in the smelting process are delivered to the east storage area. These materials are unloaded to a transfer station area, and the delivery trucks do not leave the green zone. DRC personnel and equipment pick up material from the backside of the transfer station area for use within the smelter. (See Figure 5.)

Construction Materials

These materials will be brought in and delivered to a transfer station or staging area as appropriate. The location for unloading will be selected by DRC personnel on a case-by-case basis. Materials will be unloaded within the green zone whenever possible, however in some cases it may be necessary for the delivery trucks to enter the red zone to be unloaded. Construction delivery truck traffic presents a low to high potential for tracking lead-bearing materials depending on the area of the facility the truck must travel.

Supplies

Miscellaneous general consumable supplies (e.g., oxygen/acetylene tanks approximately 4 times per month and large parts/equipment) may be delivered to the plant from 7 a.m. to 3 p.m. It may be necessary for the delivery truck to transport these and/or other miscellaneous supplies into the red zone. Tracking issues associated with these deliveries will depend on the area of the plant where the delivery is made, and in general, present a low to moderate potential for tracking.

3.1.2 Outbound Materials

3.1.2.1 Lead Products

Refined lead and lead alloy is the finished product manufactured by the plant facility. The products shipped out of this facility are in the form of lead ingots, bars, and sheets of various sizes and weights. The ingots and bars are shipped from the refinery dock and the lead sheets are shipped from the lead strip mill building. (See Figure 1.) There are approximately 630 trucks per month shipped out of the plant at the current production rate of 155,000 tons per year. There could be approximately 950 truckloads of lead products shipped out of the plant at the maximum production rate of 250,000 tons per year. Both of the areas for truck loading of lead products are within the green zone and cleaning of the trucks is not required. Due to the locations of the loading docks and the size and form of the lead products, the possibility of tracking contaminants and the lead alloy's potential impact to human health and the environment are minimal.

3.1.2.2 Smelter By-Products

There are three main smelter by-products; kettle dross, silver-rich lead-zinc alloys, and sulfuric acid. Kettle dross is a granular lead and copper-bearing product. There is approximately 600 tons of kettle dross produced by the dross plant per month. The dross plant separates copper rich dross from rough lead bullion. The copper rich dross is transferred to the new dross building at the north end of the plant, (formerly the old zinc building) and is sold as a raw material. After the separation process, dross that is low in copper content is recycled back into the process. (See Figure 1.) There are 30 to 60 truckloads of copper rich dross loaded per month from the dross building and shipped offsite. The dross hauling trucks present a moderate to high potential for tracking.

Silver products are small in volume and are cast into ingots. The ingots are shipped in covered trailers from the refinery dock and are similar to lead alloy products in how they are handled. There are approximately one to three trucks per month loaded for offsite shipment. The trucks hauling the silver ingots remain within the green zone.

The sulfuric acid by-product is shipped offsite by truck, rail and barge. If trucks transporting sulfuric acid offsite enter the red zone, they are considered to have a low to moderate potential for tracking of lead contaminants. (See Figure 1.)

3.1.2.3 Waste Materials

Nonhazardous

Regular trash, demolition material, and other miscellaneous wastes are hauled from the facility within 7 a.m. to 7 p.m., Monday through Friday. Trash dumpsters are located at various points throughout the plant, some of which are located within the red zone. Truck traffic associated with removal of solid waste represents a low to moderate potential for tracking of lead contaminants.

Hazardous, Special, and Biological Waste

The primary waste generated by the smelting process itself is the replacement of the refractory materials, which are classified as hazardous waste due to RCRA metals. Spent refractory materials are shipped offsite as a hazardous waste to a permitted facility that stabilizes and disposes of the waste in a hazardous waste landfill. The medical facility onsite generates some biological materials that are disposed of in accordance with appropriate regulatory requirements. Truck traffic associated with removal of special, biological, and hazardous waste represents a low to moderate potential to track lead contaminants.

3.1.3 Existing Structural Controls

As depicted on Figure 2, the roadways within and adjacent to the plant are classified as within red or green zones. The red roadways are internal to the plant and are considered to have the highest potential to be contaminated. All truck traffic within the red zone will be cleaned prior to leaving the plant. All roads within the green zone are external to the lead-bearing materials handling areas and are considered to have the least potential to be contaminated. Transition areas between the red and green zones are designated as blue zones and are truck and/or equipment cleaning areas. Access to the red zone is restricted by utilization of gates, fencing, and barriers except for three points. As shown on Figure 1, the three points of entry to the red zone are the main, south storage area, and east storage area entrances. Each entrance/exit has a decontamination station for equipment or vehicles departing the potential high lead area. In addition, a truck unloading facility has been added at the south storage area to eliminate the need for concentrate trucks to enter the red zone. Existing structural controls associated with these areas are described in Section 3.1.3 and proposed structural controls are described in Section 3.1.4.

3.1.3.1 Main Entrance

This entrance has a gate to prevent unauthorized entry, and the entrance is monitored by plant security. The main entrance outside of the gate and the area immediately inside the gate are considered a clean area and part of the green zone. Materials can be delivered in this area without contaminating the delivery trucks. A pressure wash is used to decontaminate vehicles entering this area from the interior of the plant, or red zone. See Figure 2. Rinse water from the cleaning area flows towards the interior of the plant away from the clean area, and it is collected in the plant's wastewater treatment system.

3.1.3.2 South Storage Area Entrance

A permanent truck wash station has been constructed to wash trucks exiting this area. (See Figure 1.) The truck wash consists of a covered drive-through building approximately the length of an end-dump tractor-trailer unit. The wash building floor is elevated above a collection pit that drains all the wash water to the facilities wastewater treatment system. Three rows of sprayers lining the side-walls of the building spray down the truck as it passes through the truck wash. In addition, water is sprayed up from the floor to wash the under carriage of the truck. A portable pressure wash equipment station is located between the permanent truck wash and the concentrate truck unloading facility. (See Figure 1.) This equipment powers the wash facility at the concentrate unloading facility as well as a wash station set up near the entrance to the permanent truck wash, which can be used in lieu of the permanent wash station. The south storage area entrance, in addition to the permanent wash station entrance and exit, are all paved with asphalt. Stormwater and wash water from the entire area is directed to a collection sump using the natural slope of the area as well as asphalt berms. The collected wash water and stormwater is pumped back to the facility's wastewater treatment system.

3.1.3.3 East Storage Area Entrance

A temporary wash station is being utilized at this location to wash all trucks or equipment prior to leaving the red zone. The east storage area is within the red zone, and the asphalt surface green zone roadway stops at the east storage area.

3.1.3.4 Concentrate Truck Unloading Station

The facility recently installed a new truck unloading facility that eliminates potential tracking issues associated with concentrate tucks entering the red zone to unload. (See Figure 1.) The new unloading station is a combination decontamination pad, elevated unloading dock, and concentrate

temporary storage bin. The trucks back up to the end of the unloading dock with the rear tires on an open pipe platform and dump the concentrate load directly into the bin. The truck then pulls forward a few feet to place the rear wheels on the decontamination pad between the pipe platform and the wash water drain grate. The tailgate and rear trailer sides, in addition to the mud flaps, are then cleaned with the use of a mobile powerwash. The decontamination pad is powerwashed as soon as the empty concentrate truck pulls off of the pad. All wash water is collected and drains to the plant's wastewater treatment system. Because the tires and undercarriage are never exposed to the concentrate at the plant and the truck never enters the red zone, the decontamination requirements are significantly reduced and the potential for tracking lead contaminants is minimized. Truck cleaning procedures during freezing conditions are addressed under the description of best management practices.

The concentrate typically contains 7 to 8 percent moisture. At this moisture content, the concentrate cakes and is not easily carried away in windy conditions. In elevated wind conditions, or if the load of concentrate is drier than normal, the Doe Run operator responsible for decontaminating the truck will spray water on the load as it is dumped.

3.1.3.5 Road Surfacing

The green zone roads have been paved with either asphalt or concrete to facilitate maintenance, cleaning, inspections, and potential spill cleanup. The plant's interior, most heavily traveled roads are also paved with asphalt or concrete. The east storage area roads are crushed rock surface.

3.1.4 Proposed Structural Controls

The following structural controls are either currently being evaluated to determine their feasibility, are proposed to be implemented, or are contingency alternatives in the event existing control measures are insufficient.

3.1.4.1 East Storage Area Entrance

A wash station using portable powerwash equipment will be set up at this location to wash all trucks or equipment prior to leaving the red zone. The east storage area is within the red zone, and the asphalt surface green zone roadway stops at the east storage area.

3.1.4.2 East Storage Area

The east storage area is shown on Figure 1. The current green zone asphalt surfaced road will be extended to the approximate location shown on Figure 2. The red zone immediately west of the

extended green zone road will be for storage of nonlead-bearing fluxes and coke fuel. The east side of the road is a green zone. The flux materials and coke will be unloaded west of the road, but the delivery trucks will not enter the red zone. The trucks will back into the nonlead-bearing storage area and unload their material. A loader will pick up the material from the west side of the storage pile and load a nearby rail car that will deliver the fluxes and coke to the interior of the plant. A sign will be placed at the end of the green zone road stating that all traffic beyond this point will be required to be washed prior to re-entry onto the green zone road.

The north end of the east storage area will be utilized for potentially lead-contaminated materials or equipment and is within the red zone. All truck traffic entering this area will be required to follow the return route through the red zone and utilize the portable high pressure/high volume truck wash station within the transition area to the green zone.

3.1.4.3 Potential Alternate Truck Route

The Doe Run Company is evaluating the feasibility of alternative haul routes that would allow for plant traffic to travel to and from the smelter without using the residential streets in town. In addition to the cost of the alternate route itself, the feasibility of constructing an alternate route is also dependant upon the cost of implementing other measures under consideration by DRC to address the offsite lead contamination issue. Doe Run will produce a schedule within 30 days of approval of this plan. There are two potential alternative routes under consideration and are shown on Figure 3.

Old Joachim Railroad Bed Bypass

DRC is evaluating a south haul road. This road would essentially follow the old railroad bed, around the south side of town along the north side of the slag pile and cross the Joachim Creek by bridge and eventually tee into Highway 61/67. This alternative route has several challenges primarily associated with crossing Joachim Creek and the financial costs of constructing a bridge.

Circle Street Bypass

The current plan is to build a road, if feasible, that would connect Circle Street with Joachim Avenue. This route would require the acquisition of property and the construction of a new road connecting Circle Street with Joachim Avenue. Agreements and approvals with the City of Herculaneum and others would be required to implement this alternative.

3.1.4.4 Automated Truck Wash

The necessity and feasibility of construction of an all-weather enclosed truck wash as a final step for all trucks leaving the plant is also being evaluated. The truck wash would be similar to a commercial automated truck wash that could accommodate tractor-trailer units and could be used during freezing weather conditions. The location of the truck wash would be dependent upon the construction of an alternative truck route, but it would most likely be in the general area of the southwest area of the plant. A decision on the need for an automated truck wash would be made after other measures specified in the truck transportation plan, including the location of an alternate truck route, have been evaluated and implemented. Doe Run will produce a schedule within 30 days of approval of this plan.

3.1.4.5 Main Entrance

Concrete barriers, or equivalent, will be constructed within the main entrance area to delineate the green zone from the red zone. A permanent powerwash system will be constructed for vehicles leaving the internal plant, or red zone, area as part of the blue zone transition area.

3.1.4.6 Second South Storage Area Truck Unloading Facility

Doe Run is planning to construct a second truck unloading facility next to the concentrate truck unloading facility. This unloading facility will be utilized to unload a variety of bulk materials as part of the ongoing effort to minimize truck traffic entering the red zone of the plant. Doe Run will produce a schedule for this item within 30 days of approval of this plan.

3.1.4.7 Transfer Stations, Dedicated Plant Trucks/Equipment

Loading docks, loading/unloading stations, or other types of transfer facilities will be considered/constructed where possible for unloading of material at the border of the red and green zones. The transfer stations will allow clean trucks to directly transfer materials from the green zone into the red zone. The materials would then be available for DRC personnel using in-plant dedicated trucks or equipment to deliver the materials as needed in the red zone.

3.1.5 Best Management Practices (BMPs)

Best management practices may include training, general cleaning procedures, inspections, certifications, schedules, review meetings, preventive maintenance, and spill control contingency procedures as well as other nonstructural controls. This section provides a summary of the best management practices the facility has implemented to control materials transported to and from the

facility. Appendix B contains examples of record documents such as checklists, certificates of inspection, and log sheets. Appendix C contains the detailed best practice procedures, or detailed worker instructions.

3.1.5.1 Training

DRC personnel responsible for decontaminating vehicular traffic entering and exiting the plant will receive specific training. This training will include the importance of cleaning the vehicles, the procedures for cleaning, inspections, records, etc.

DRC personnel operating the wet street sweepers will receive training on operation of the sweeper; importance of maintaining and following designated routes within the facility; following the designated schedule for cleaning specific areas or routes; and reasons why the wet plant sweepers are not to be used outside of the plant.

All DRC Herculaneum personnel receive training on the hazards associated with lead and how to minimize their exposure, as well as best management practices for handling lead and metal bearing materials, including utilization of appropriate personal protective equipment.

3.1.5.2 Control of Vehicles Entering the Plant

Vehicles that must enter the plant within the red zone are directed to take designated routes through the facility to prevent unnecessary contamination. Vehicles entering the plant are required to minimize their speed so as to minimize the amount of flinging and splashing of contaminants on the trucks' undercarriage. Drivers are notified of the plant traffic conditions, decontamination procedures, and safety requirements prior to entering the facility.

Where appropriate, delivery materials will be staged in green areas and transferred to dedicated internal plant trucks or equipment.

3.1.5.3 Vehicle Decontamination

Each vehicle that enters the red zone will exit through a wash station where it will be decontaminated utilizing a high pressure/high volume powerwasher to remove potential lead-bearing residues from the vehicle. The decontamination wash will be focused on the vehicle's tires and undercarriage. If potential lead-bearing material is observed on the body of the truck during the inspection, it will also be washed. Detailed work instructions are included in Appendix B. Doe Run will provide a schedule for implementation of all truck wash stations within 30 days of approval of this plan.

3.1.5.4 Vehicle Decontamination in Freezing Conditions

Washing vehicles with water during potential freezing conditions creates an icing safety issue for traffic as well as employees required to wash the trucks. The misting of water can create ice at slightly above normal freezing temperatures. Therefore, during days when the temperature is below 35° F or when potential freezing conditions exist, vehicles will be cleaned by a dry method. The trucks will be swept with a broom and vacuumed with an industrial vacuum to remove loose material. If necessary, frozen material containing potential lead contaminants will be chipped off of the truck prior to cleaning.

3.1.5.5 Inspections and Certifications

Doe Run personnel inspect each vehicle after it has been decontaminated. The inspection is focused on the undercarriage, tires, mud flaps, and tailgate areas. Detailed procedures are included in Appendix B. A certificate of inspection is given to the driver after the vehicle has passed the inspection. Examples of records including inspections and certificates are included in Appendix C.

3.1.5.6 Signs

Signs will be posted at the entrance/exits of the red zone to inform and remind drivers that they are entering or departing a potentially lead-contaminated zone and that their vehicle will require decontamination as they leave the red zone.

3.1.5.7 Cleaning of Internal Roads

The facility uses a wet sweeper to clean the red zone or internal hard surface plant roads. Special attention is given to cleaning the designated routes for vehicles that must enter the red zone. The sweeper utilized to clean the plant's internal roads within the red zone will not be used to clean streets outside of the red zone. The plant's designated routes for delivery vehicles are areas scheduled for daily cleaning utilizing a wet sweeper. The internal plant areas designated for wet sweeping are shown on Figure 4. The wet sweeper is required to cover all of the designated areas at least once daily, barring unplanned interruptions such as equipment malfunctions or inclement weather.

In addition to wet sweeping of the plant's internal roads, heavy use areas, or areas that may have a high potential for lead contamination receive additional steps to minimize potential fugitive emissions and/or receive a thorough cleaning. Some of the additional steps are continual sprinkling of an area or hosing down specific areas on a scheduled frequency.

The movement of slag handling equipment to be utilized at the slag pile crosses the green zone road at the railroad crossing at the south end of the plant. DRC employees immediately clean the area of the road where the equipment crosses with shovels and brooms. In addition, boards or other covering material may be used to prevent the vehicles from tracking lead-bearing materials onto the road and to facilitate cleaning.

3.1.5.8 Road Maintenance

Within the facility, the area managers are responsible for ensuring that the designated traffic roadways are maintained so that they can be adequately cleaned by the wet street sweeper. Lead-bearing material will be kept out of the traffic area to the extent possible. The structural condition of the roads will be inspected once a calendar quarter. Repairs will be scheduled as needed.

3.1.5.9 Spill Detection and Cleanup

Within the facility, the area managers, or their designee, will inspect the designated routes within the facility used by offsite trucks that enter the red zone. If spills or significant tracking of lead-bearing materials from internal plant traffic is observed, the area will be cleaned as soon as possible. Inspections of the preferred routes are performed daily.

3.1.5.10 Management Review

Plant management will review this plan annually to determine its effectiveness. The review will include analytical testing and data assessment, structural controls, best management practices, and work instructions. If necessary, additional sampling and testing will be scheduled. Structural controls and best management practices not meeting expectation or not providing adequate control will be updated. Where appropriate, designated alternative or new structural controls and best management practices will be implemented.

3.2 Mines – Outbound Lead Concentrate

There are four Doe Run mills that produce the lead concentrate that is shipped to the Herculaneum smelter. The mills are the Brushy Creek, Fletcher, Buick, and Sweetwater mine/mill facilities. A transportation plan addressing loading of the concentrate into the trucks at the mills for shipment to the Herculaneum smelter will be developed and submitted under separate cover. The transportation plan will address existing and proposed structural controls and a description of best management practices to minimize the potential for lead contaminants on the outside and/or undercarriage of the trucks. This minimizes the potential for depositing lead concentrate on the public roadways between

the mills and the smelters. It also ensures that inbound concentrate trucks are clean upon arrival, and it minimizes the extent of cleaning required for the trucks upon unloading.

3.3 In Route – Lead Concentrate

3.3.1 Structural Controls

3.3.1.1 Bulk Trailers for Lead-Bearing Materials

Tarped trailers used to haul DOT Hazard Class 9 materials in bulk meet DOT packaging requirements. These trailers are equipped with heavy-duty tight sealing tarps. The trailers are constructed to prevent sifting of concentrate material. The tailgates are fitted with a double locking closure to ensure a snug fit at the interface between the trailer bed and tailgate and to prevent the tailgate from opening during transport.

3.3.1.2 Spill Equipment

The transport contractor is responsible for responding to any spills during transit and maintains the necessary equipment for adequate response.

Although the contractor has the responsibility to respond to spills, DRC stocks spill response equipment and supplies that can be quickly loaded onto a small truck in the event there is a spill during transit and additional equipment may be needed. The spill equipment includes shovels, bags, drums, PPE, two-way radios, and traffic barriers.

3.3.2 Best Management Practices (BMPs)

3.3.2.1 Dry Street Sweeping

The designated routes for inbound and outbound trucks transporting lead-bearing materials to and from the plant through Herculaneum are swept with a mechanical dry sweeper at least daily. These roads include Main Street, Joachim Road, Brown Street, and Station Street as depicted in Figure 3. Streets east of Highway 61/67 that are not part of the designated truck routes are swept as deemed necessary but not on a set schedule. Currently the dry sweeper utilized is a Schwarze EV1 dry vacuum street sweeper. The EV1's vacuums pull 15,000 cfm. Materials picked up from the road drop out into an internal hopper, and the air is discharged through 2.5 micron dry polyester cartridges.

3.3.2.2 Training

DRC requires that all drivers transporting lead concentrate remain current on all required DOT hazardous materials training. DOT hazardous materials training is also provided to all DRC employees at Herculaneum. In addition, general lead awareness training is provided to all DRC employees.

3.3.2.3 Road Inspection

DRC crews inspect the designated haul roads up to Highway 61/67 on a daily basis. The crew carries shovels, brooms, and containers to clean up any observed minor spills as soon as they are observed.

3.3.2.4 Spill Response

In the event of a large spill, the carrier is responsible for providing cleanup response. The Doe Run Company provides oversight and assistance to ensure the area is properly and adequately cleaned.

4.0 Railroad Transportation Plan

4.1 Rail Inbound

4.1.1 Lead Concentrate

The Doe Run Company plans to utilize rail service as soon as possible and is scheduled to begin hauling concentrate to Herculaneum on a limited basis by June 2002. Upon completion of the transload station at the Doe Run Glover facility, Doe Run will begin shipping up to 40 rail cars per week of lead concentrate to Herculaneum.

4.1.2 Coke

Coke will be received by commercial rail on an intermittent basis and spotted on the Doe Run switchyard at the Herculaneum facility. The cars will be spotted in place by the Doe Run engine at the south end of the plant and unloaded to the stockpile. The coke will then be reloaded to bottom dump cars and transferred to the Number One Trestle coke bins where the bottom dump cars will be unloaded and the coke fed to the process.

4.2 Rail Outbound

4.2.1 Refined Lead and Lead Alloys

Refined lead and lead alloys are the finished products manufactured by the facility. These products are shipped out of the facility in the form of lead ingots and bars in a variety of weights and sizes, and large sheets of lead for the battery industry. The ingots and bars are shipped from the refinery dock, and the lead sheets are shipped from the lead strip mill building. Due to the form and physical nature of these products, their potential impact to human health and the environment is easily managed, and the products have negligible potential for contributing to fugitive emissions from the facility.

4.3 Existing Structural Controls

4.3.1 Sift-Proof Rail Cars

Arrangements have been made for sift-proof rail cars designed to transport Class 9 hazardous materials, including lead concentrate. These cars will be employed to transport concentrate from the

Glover transload station to the Herculaneum plant. In order to meet the DOT sift-proof specifications, these cars have a completely sealed car body and a sealing fiberglass plastic composite top.

4.3.2 Rail Car Unloader

The Herculaneum plant has a rail car unloader that transfers the ore concentrate directly into the feed hopper of the smelter. Rail cars are pushed up the trestle to the unloader station. Once in position, the unloader transfers the concentrate into the feed hopper by rotating the rail car approximately 160° from vertical.

4.4 Proposed Structural Controls

4.4.1 Transloading Station – Glover

A transloading station is being constructed at the Glover Smelter facility in an effort to reduce the truck traffic hauling concentrate to the Herculaneum facility. Doe Run will provide a schedule for implementation of the transloading station within 30 days of approval of this plan.

Lead-concentrate trucks coming from the four mills (Brushy Creek, Fletcher, Buick and Sweetwater) will arrive at the Glover facility on Missouri Highway 49 South. The trucks will cross over the trestle and then back up to one of two grizzly screens to dump. Each grizzly will be covered with a structure that has a roll-up door to allow trucks to dump directly onto the grizzly and directly into the rail car spotted below the trestle. Both structures will be ventilated to a 25,000 ACFM cartridge-type baghouse. The baghouse will activate when the roll-up door is opened. The capacity of a single rail car is equivalent to four trucks.

4.5 Best Management Practices

4.5.1 Rail Car Unloader

Rail cars loaded with lead concentrate will be delivered to the Doe Run facility by commercial rail service where Doe Run personnel will check the cars into the DRC rail yard. DRC personnel will document all pertinent information. All signs of damage or visible spillage will be immediately reported to a supervisor. Loaded rail cars will be stored covered in the rail yards or the thaw house until the concentrate is to be removed.

Cars that are to be unloaded with immediate need concentrate will be taken from the rail yard or thaw house and spotted south of the rail car unloader. The rail car cover will be removed and the car moved into the unloader mechanism. The car will be tipped and the concentrate will be unloaded into the hopper. The car will be righted, checked for and cleaned of any visible spillage on the outside of the car, and then moved back from the unloader with the cover again placed on the rail car. If any concentrate is observed on the rail car, it will be washed or brushed clean. The car will then be inspected and all pertinent information will be documented. Cars will normally be unloaded at the unloader between the hours of 6 a.m. to 6 p.m.

4.5.2 Rail Cars to Stockpile Area

Efforts will be made to unload all incoming rail cars at the unloader. However, in situations where the smelter is not operating, the unloader is not operational, more concentrate is received than can be processed upon receipt, or other instances that prevent utilization of the unloader, concentrate will be unloaded in the south stockpile area using an excavator fitted with a clamshell bucket. Rail cars that must be unloaded to the stockpile will be taken from the DRC rail yard or thaw house and spotted south of the rail car unloader to have covers removed. The cars will then be moved to the stockpile at the south end of the plant and unloaded with an excavator. After obtaining a bucket full of material from the rail car, the operator will lower the bucket close to the pile before opening the bucket to minimize the potential for fugitive lead-contaminant emissions. After the car has been emptied, it will be checked for concentrate material on the outside of the box. If concentrate is observed on the rail car, it will be washed or brushed clean. Once inspected and determined clean, the car will be moved back to the area south of the unloader and the cover will be replaced and secured. The car will be inspected and all pertinent information documented. The empty covered cars will then be spotted in the DRC rail yard for pick up by the commercial rail service.

4.5.3 Transload Station - Glover

The rail cars will be inspected for damage prior to loading. If damage is observed or suspected, the rail car will be taken out of service for further evaluation and/or maintenance. Once a rail car is loaded and the cover placed on the car, it will be inspected to ensure that the outside of the car is free of lead concentrate. If concentrate is observed on the rail car, it will be washed or brushed clean. Once inspected and determined clean, the loaded covered cars will then be spotted in the DRC rail yard for pick up by the commercial rail service.

The area around the tracks will be paved to allow easy cleanup either by sweeping or wash down. All wash down water and stormwater in the immediate area of the transload station will be collected and treated at the wastewater treatment plant. The area will be cleaned between truck deliveries and at the end of each work day.

4.5.4 Product Dock

Refined lead products at the refinery and strip mill building loading docks are stored under roof. Rail cars to be loaded are spotted next to the loading docks minimizing the exposure of the products during loading operations.

Refinery dock and strip mill personnel will inspect the Doe Run rail car siding area each shipping day for lead-bearing materials that may have been spilled. If any lead-bearing material is discovered, the spilled material will be removed and the specific area will be cleaned if necessary. The date and the person performing the inspection and cleanup will be recorded in the refinery dock and strip mill logbooks.

5.0 Barge Transportation Plan

Barge transportation of lead concentrate or other lead-bearing materials is not currently being utilized at the Herculaneum smelter facility, nor are there plans to utilize barge hauling of lead concentrate in the immediate future. In the event The Doe Run Company should decide to resume barge transportation of concentrate or other materials at the Herculaneum facility, the barge transportation plan will be evaluated and updated. The updated plan will be incorporated in this overall plan prior to the use of the barge unloading facility to transfer lead concentrate or lead-bearing materials.

6.0 Materials Handling Plan

This section is intended to address handling of in-plant materials that have the potential to generate fugitive dust emissions and the potential to cause tracking of lead-bearing materials within the plant and outside of the plant. The various storage locations of the in-plant materials described in this section are shown on Figure 5.

Process Overview

Lead concentrate (lead sulfide), slag, flux, and other lead-bearing materials are roasted in the sintering plant to produce lead oxide sinter. The sinter is then charged into the blast furnace with coke and additional flux. Molten lead and slag are tapped from the bottom of the furnace. The molten lead is transferred to the dross plant and allowed to cool to remove copper and other impurities. These impurities are skimmed off of the top of the molten lead. The molten lead is then transferred to the refinery kettles where silver and zinc are removed. The lead is further refined to remove any final impurities and then cast into lead and lead alloy products.

6.1 Lead Concentrate

Lead concentrate delivered to the facility by rail is unloaded at the rail car unloader and transferred to the sinter plant mix-room bins by conveyor. DRC plans to optimize utilization of the concentrate in the smelter upon receipt at the plant (rail car just in time usage). However, if there is not sufficient storage capacity at the mix-room storage bins, concentrate is stored in the rail cars or unloaded in the south storage area.

Concentrate delivered by truck at the concentrate truck unloading station is unloaded into the temporary storage bin. Concentrate will be moved from the temporary storage bin by front-end loader. Concentrate will either be loaded into gondola rail cars for immediate use or moved to the south storage area. When needed, the concentrate at the south end storage area will be loaded into gondola rail cars by front-end loader and moved to the car unloader by DRC's yard engine.

6.1.1 Existing Structural Controls

Particulate from the sinter plant and storage bin area is collected and filtered in Baghouse 3 and the south end baghouses. Dust and other particulate from the baghouses are recycled back into the sinter plant material.

Sulfur dioxide gas is released by the oxidation of lead sulfide in the sintering process and is captured by the acid plant where industrial grade sulfuric acid (93.5 percent concentration) is produced. This acid is stored in tanks at the facility and sold as a product.

Sinter plant bins, conveyors, and feed systems are located inside the sinter plant building. The conveyor from the sinter plant to the blast furnace is enclosed.

The rail car unloader is inside a covered building and the conveyor from the rail car unloader to the sinter plant mix-room storage bins is enclosed to reduce the potential to create airborne dust.

Stormwater and surface water runoff from the south storage area, concentrate handling areas, and the rail car unloader is collected and treated in the facility wastewater treatment plant.

6.1.2 Proposed Structural Controls

DRC is studying the feasibility and effectiveness that doors installed at the end of the unloader structure may have on potential fugitive emissions. If doors are determined to significantly reduce the potential for fugitive emissions and are feasible, the facility will begin the planning, design, and procurement of the doors. A schedule will be submitted by DRC within 30 days of approval of this plan.

The facility is also evaluating the feasibility of constructing a conveyor to directly transfer concentrate from the concentrate truck unloading facility to rail cars within the south storage area.

6.1.3 Best Management Practices

If the concentrate shows signs of dusting while being handled, it will be wetted. A portable water spray fogging system may be utilized in addition to or in lieu of the fixed water spray system. Rail cars will be unloaded in the storage area with an excavator fitted with a clamshell bucket. After obtaining a bucket full of material from the rail car, the operator will lower the bucket close to the pile before opening the bucket, thereby minimizing the potential for fugitive lead-contaminant emissions.

Concentrate is usually damp and not prone to dusting, however if it is dry and dusty, upon completion of unloading, the concentrate stockpile will be sealed by spraying a hydrated lime and water solution (milk of lime), or other suitable solution, on the surface of the stockpile. The lime and water solution then dries and forms a coating, or crust, over the surface of the stockpile reducing the potential for fugitive air emissions.

Plant personnel responsible for handling concentrate will receive training on best management practices for handling lead-bearing materials as well as the importance of reducing fugitive emissions.

6.2 Sinter

Sinter is transferred directly to the blast furnace by conveyor. The sinter plant is taken off line on an average of twice a week for maintenance. The blast furnace operates nonstop. As a result, sinter plant production must exceed the blast furnace consumption in order to have enough sinter to feed the blast furnace while the sinter plant is off line. When the sinter plant out-produces the blast furnace and exceeds sinter plant storage bin capacity, sinter is loaded into rail cars or transferred to the south storage area via DRC dump trucks.

When the sinter plant is off line, the sinter handling process is reversed. Sinter stocked in the south storage area is loaded into bottom dump rail cars. Bottom dump rail cars are emptied on Trestle Number One where the sinter is directly transferred to the blast furnace feed bins.

6.2.1 Existing Structural Controls

Particulate from the sinter plant and storage bin area is collected and filtered in Baghouse 3 and the south end baghouse. Dust and other particulate from the baghouses are recycled back into the sinter plant material.

Sulfur dioxide gas is released by the oxidation of lead sulfide in the sintering process and is captured by the acid plant where an industrial grade sulfuric acid (93 percent concentration) is produced. This acid is stored in tanks at the facility and sold as a by-product.

Stormwater and surface water runoff from the south storage area, the sinter plant area, and rail car unloader is collected and treated in the facility wastewater treatment plant.

6.2.2 Proposed Structural Controls

DRC is evaluating the feasibility and effectiveness that dust control doors may have on the potential for minimizing fugitive emissions on the unloading trestle. If doors are determined to significantly reduce fugitive emissions and are feasible, the facility will begin planning, design, and procurement of the doors. A schedule will be produced by DRC within 30 days of approval of this plan.

6.2.3 Best Management Practices

When the sinter plant is brought back online, sinter will first be taken from the storage bins, followed by sinter stored in rail cars, and then from the sealed south storage area. This order of utilizing the available sinter will help reduce the amount of material handling and thus reduce the potential for fugitive emissions.

The sinter will be wetted before it is unloaded from the yard trucks, pushed into piles by the front-end loader, or loaded into rail cars. If the sinter shows signs of dusting while being handled, it will be wetted some more.

The sinter stockpile will be sealed by spraying a hydrated lime and water solution (milk of lime), or other sealant, on the surface of the stockpile. The sealant solution dries and forms a coating, or crust, over the surface of the stockpile.

Equipment operators and plant personnel responsible for handling sinter will receive training regarding best management practices and the importance of reducing fugitive dust emissions as a result of handling sinter. Ultimately, the facility plans to store all stocked sinter in rail cars, eliminating the need for loading and unloading sinter in the south storage area.

6.3 Fume

The blast furnace is the primary source of fume generated at the facility. Fume and dust emitted by the blast furnaces are captured in Baghouse 5. Fume from this baghouse is recycled directly to the sinter plant via the Redler conveyor. Fume is also collected from other areas within the plant and is recycled directly to the sinter plant or accumulated in special totes and super sacks. When the totes and super sacks are full, they are transferred to Baghouse 3 where they are vacuumed into a cell and then recycled back to the sinter plant as feed.

It is the goal of the plant to recycle all fume into the sinter process as generated. However, when the sinter plant is off line, fume from Baghouse 5 is run through a pugmill and stored in rail cars. When the sinter plant is back online, fume will be unloaded at the rail car unloader, transferred to the sinter building, and recycled into the sinter feed.

6.3.1 Existing Structural Controls

Fume is directly transferred to the sinter plant from the baghouse via the covered Redler conveyor while the sinter plant is operating. The conveyor significantly reduces the potential for fugitive emissions as a result of transferring fume.

The rail car unloader is inside a covered building and the conveyor from the rail car unloader to the sinter plant storage bins is enclosed to reduce the potential to create airborne dust.

Stormwater and cleanup water runoff from the fume handling area is collected and treated in the facility wastewater treatment plant.

6.3.2 Proposed Structural Controls

As previously discussed, DRC is currently evaluating the feasibility and effectiveness of installing doors on the unloader enclosure.

DRC is planning on using covers for fume rail cars.

6.3.3 Best Management Practices

Fume will be transferred via the Redler conveyor directly to the sinter plant whenever possible. Whenever the sinter plant is off line, fume will be wetted using the pugger and then loaded and stored in covered rail cars. The storage of fume in covered rail cars significantly reduces the potential for fugitive emissions associated with the handling of the fume as compared to stockpiling the fume and the additional loading and unloading associated with stockpiling. When the sinter plant is back online, fume stored in rail cars will be unloaded as soon as practical.

In the event of a prolonged sinter plant outage and as a last resort, fume may be stockpiled in the south storage area. The unloading procedures utilizing an excavator equipped with a clamshell bucket will be followed as previously described. The wetting procedures as previously described for loading, unloading or movement of the stockpile for lead concentrate and sinter at the south storage area will also be followed. The stockpile of fume will be sealed by spraying a hydrated lime and water mixture to minimize the potential for fugitive dust emissions. When the sinter plant is back online, fume will first be taken from the rail cars, followed by fume from the sealed storage piles. This order of utilizing available fume minimizes the amount of fume handling, thereby reducing the potential for fugitive emissions of lead-contaminated material.

Equipment operators and plant personnel responsible for handling fume will receive training regarding best management practices and the importance of minimizing the potential for fugitive dust emissions associated with handling fume.

6.4 Dross

Kettle dross is generated as a by-product of the smelting process. Kettle dross is a granular lead and copper-bearing product. Dross is produced in the dross plant by slowly cooling the kettles of lead and allowing the copper to move from the liquid phase to solid phase. As the lead cools, the solid copper phase will float to the top of the kettle and be skimmed off and placed in a wetting screw. At the end of the wetting screw, the material feeds to the dross floor, is picked up by a bobcat, and placed on a day storage pad in the dross plant to await assay results. Dross that is low in copper content will be loaded on a conveyor belt and recycled in the blast furnace. Dross that is high enough in copper content will be moved to the future dross building (formerly referred to as the old zinc building) for storage. The high copper content dross is sold as a raw feed material for copper smelting. On a periodic basis, the dross is loaded from the east side of the building by front loader into covered commercial end-dump tractor-trailer units for transport offsite.

6.4.1 Existing Structural Controls

With the exception of loading delivery trucks, dross is handled within the dross plant and blast furnace buildings where a portion of the air is filtered through a baghouse. The dust and fume from the baghouse is recycled back into the sinter plant feed. A dross wetting screw is used to wet the dross prior to being transferred to the future dross storage building.

Stormwater and cleanup water runoff from the dross plant and storage building area is collected and treated in the facility wastewater treatment plant.

6.4.2 Proposed Structural Controls

Complete building enclosure of the dross plant and blast furnace buildings along with increased air filtering capacity will be completed by July 31, 2002, thus eliminating dross handling emissions from this operation. Dross staged for shipment in the future dross storage building will be wetted prior to loading into covered commercial trucks.

Additional work will be done on the old zinc building to upgrade the structure to further reduce the potential for emissions from the storage of dross. A schedule will be provided by DRC within 30 days of approval of this plan.

6.4.3 Best Management Practices

Dross will be wetted if visible emissions are present during the truck loading operations at the future dross storage building to minimize the potential for fugitive emissions of lead contaminants. The truck route for the commercial trucks is within the daily wet sweeping area and the trucks are washed upon leaving the plant.

Equipment operators and plant personnel responsible for handling dross will receive training regarding best management practices and the importance of reducing fugitive dust emissions as a result of handling dross.

6.5 Flux

DRC utilizes both lead-bearing and nonlead-bearing flux materials. Both forms of flux may be shipped to the facility in sift-proof cubic yard boxes, super sacks, 55-gallon drums, bulk end dump trucks, or rail car. Examples of lead-bearing flux materials include leaded CRT flux glass, sand blast material, cleanup soil/silica, and electrical components. Nonlead-bearing flux may include sulfur, coke breeze, coke, copper, zinc, glass, sand/silica, iron pyrite, mill scale, limestone, lime, and clay.

Lead-bearing flux materials shipped by truck in cubic yard boxes, super sacks, 55-gallon drums, or other pallet sized containers are unloaded at the strip mill dock area. The materials are then loaded in a boxcar on the east side of the strip mill building. The DRC yard engine then moves the boxcar to the south storage area where the material is unloaded and stored until utilized in the smelting process.

Bulk lead-bearing flux materials are unloaded directly in the south storage area. Bulk nonlead-bearing fluxes will be delivered to and unloaded at the future east storage area.

As flux is needed, it is loaded onto rail cars from storage and delivered to the blast furnace feed bins at Trestle Number One or sinter plant bins via the rail car dump. Flux may also be transferred directly to the blast furnace charge or sinter plant charge using rail cars, yard dump trucks, or front-end loaders.

6.5.1 Existing Structural Controls

The south storage area spray system is available for use to reduce the potential for fugitive emissions associated with handling lead-bearing fluxes that may create dust.

Stormwater and surface water runoff from the lead-bearing flux storage areas is collected and treated in the facility wastewater treatment plant.

The future east flux storage area will be constructed to store nonlead-bearing flux. This facility is designed so that bulk delivery trucks can unload directly into the red zone without actually entering the red zone. This eliminates the tracking potential associated with trucks entering the red zone to deliver nonlead-bearing flux.

6.5.2 Proposed Structural Controls

DRC is planning to construct a new bulk truck unloading station for lead-bearing flux and other materials to be delivered to the south storage area. This will reduce the truck traffic entering the red zone of the plant and further reduce the potential for tracking of lead contaminants. The new truck unloading facility will be constructed adjacent to the existing truck unloading facility at the south storage area entrance. A schedule will be produced by DRC within 30 days of approval of this plan.

As stated elsewhere, DRC is also evaluating the feasibility of constructing a conveyor system for transport of materials directly from the temporary storage bins at the truck unloading facility to rail cars at the south storage area. A schedule will also be provided for this item within 30 days of approval of this plan.

6.5.3 Best Management Practices

Any containerized lead-bearing material with the potential for fugitive emissions if the container integrity is compromised will be taken directly to the smelter for processing. The strip mill truck and rail dock area will be inspected and cleaned as necessary after each shipment of lead-bearing fluxes.

A water wetting system will be used to supplement the south storage area water spray for loading and unloading bulk lead-bearing fluxes with the potential for creating airborne contaminants. A hydrated lime and water solution will be applied to stockpiled lead-bearing fluxes with the potential for fugitive lead contaminants.

Plant personnel responsible for handling flux receive training on best management practices for handling lead-bearing material.

6.6 Slag

The two types of slag produced at the blast furnace are granulated slag and shell slag. Spraying molten slag with high pressure water as it runs out of the slag launderer produces granulated slag. This slag is slurried to the slag dewatering bins where excess water is removed. Most granulated slag is recycled to the Sinter Plant. The recycled slag is moved directly from the dewatering bin via conveyor belt to the Sinter Plant mixing bins. Excess slag that is not needed by the Sinter Plant is loaded onto rail cars and moved to the slag storage area south of the plant.

A very small percentage of shell slag is produced when difficulties occur with the water spray slag granulation system. It is tapped from the front of the furnace into slag pots. These pots are placed on a small rail car and moved to the slag shell cooling area. The slag pots are tipped allowing the slag shell to fall out onto the ground. The slag shell cooling area is located just east of the water treatment plant. Once cool, the shell slag is loaded onto a rail car and hauled to the slag storage area.

6.6.1 Existing Structural Controls

The slurry handling system reduces the potential for fugitive emissions from handling granular slag. The slag removed from the slag dewatering bins still contains enough moisture to keep the slag damp as it is transferred to the sinter mix-room bins by covered conveyor. Slag transferred to the slag storage area by rail car contains enough moisture to minimize the potential for fugitive emissions.

6.6.2 Proposed Structural Controls

DRC is evaluating various structural controls for the slag storage area in accordance with the requirements specified under the Administrative Order on Consent (Docket No. CERCLA-7-2000-0029/RCRA-7-2000-0018).

6.6.3 Best Management Practices

DRC personnel will ensure that slag handling activities do not create a dusty condition or have a potential for fugitive emissions.

Plant personnel responsible for handling slag will receive training on best management practices for handling slag.

6.7 Coke

Coke is a nonlead-bearing carbon by-product of the refining industry. It can contain fines that have the potential to create fugitive dust. Coke is used as both a flux and a source of fuel for the smelting process. A majority of the coke is delivered by rail and to a lesser extent by truck. Loaded rail cars will be stored in the rail yards or the thaw house until the coke is to be removed. Coke cars will normally be emptied directly to the #1 Trestle as a furnace feed. Rail cars containing coke may also be unloaded and then reloaded at the south end storage area by excavator. Trucks hauling coke will be unloaded at the east storage area.

6.7.1 Best Management Practices

The potential for lead emissions from coke are derived from the in-plant dust.

6.8 Plant Cleanup and Maintenance

This section addresses nonprocess activities and associated materials that have a potential to generate fugitive dust or a potential to track lead-bearing materials.

DRC will, when appropriate, recycle cleanup materials back into the process within the department in which the material was generated. Cleanup material that cannot be recycled within the department will be processed and recycled back into other feed stock materials. The feed stock where cleanup materials are recycled is dependent on the size of the cleanup material. Cleanup materials will be sized by a power screen or by hand. Material less than one inch in size is recycled into the sinter plant feed. Material between one and four inches is recycled into the blast furnace feed at Trestle Number One. Materials greater than four inches are introduced into the top of the blast furnace.

6.8.1 Road Dust Control

Internal plant roadways may accumulate dust and other lead-bearing materials. In an effort to control potential tracking of lead contaminants within and outside of the facility, DRC has implemented a road cleaning program. This program consists of best management practices including rapid spill cleanup response, daily wet mechanical sweeping, continual wetting of designated areas by water sprinklers, and manual hose down and cleaning of specific areas. Designated internal roadways are paved and physically maintained so as to facilitate their cleaning. Figure 4 shows the internal area cleaned by mechanical wet sweepers or by water hosing.

6.8.2 In-Plant Demolition Materials

Material generated during construction projects, demolition, etc. will be evaluated for reuse or disposal. Material to be disposed of usually falls into three different categories.

Metal

Metal that can be cleaned will be separated so that it can be sold to an appropriate scrap dealer. This metal scrap will be cleaned at the north end of the furnace crane bay where it will be cut and sized to fit in a trailer. Scrap metal trucks will be loaded at the north end of the furnace crane bay and upon exiting will be washed at the front gate wash station. Metal that cannot be satisfactorily cleaned will be cut and sized at the north end of the furnace crane bay. The scrap metal will be sized to fit in a bobcat bucket. The metal will then be recycled into the top of the blast furnace.

Concrete

Minus four-inch material will be recycled into the smelter feed materials. Four-inch plus material will be cleaned and placed in a demolition debris dumpster staged in the south storage area. The concrete will be disposed of in accordance with applicable regulatory requirements.

Demolition Excavation Material

Potential lead-contaminated demolition excavation materials and associated soils will be sized and recycled into the appropriate feed stock material as applicable. Material that cannot be recycled will be disposed of in accordance with applicable regulatory requirements.

6.8.3 Plant Sumps and Wastewater Treatment Sludge

Clean out material from drain sumps located within the plant are stored in the wet sump shed located in the south storage area. The material is recycled as part of the sinter feed. If the sump material is dry when it is removed from the wet storage shed, a water fogging system will be utilized to prevent fugitive dust emissions.

All plant process, wash down, and drainage water is treated at the wastewater treatment plant and discharged according to the facility NPDES discharge permit. Filter press cake generated by the wastewater treatment plant is gravity loaded into a Doe Run rail car at the wastewater treatment plant. The filter cake material is then unloaded at the south storage area. When the material is sufficiently dry, it is loaded back onto a rail car, unloaded at the rail car unloader, and recycled in with the sinter plant feed. If the cleanup and filter cake materials have the potential to generate fugitive dust, they will be sprayed or misted with water during loading.

6.8.4 Barrings

Blast furnaces are periodically taken off line for maintenance. When the maintenance includes digging out and removing the molten and semi-molten charge materials, referred to as barrings, they will be stored indoors in the blast furnace department until they can be recycled back into the furnace. If a full dig out of the furnace is necessary, barrings will be screened before recycling back into the furnace. These barrings will be moved outside to the screen area by front-end loader. A water spray system will be used during the screening to minimize the potential for fugitive dust emissions. Barrings less than one inch in size will be recycled back to the sinter plant. Barrings between one and four inches in size will be stored on the pad by the screen until they can be loaded into a bottom dump rail car. Upon loading, utilizing the water spray fogging system as necessary, the rail car is moved onto the Number One Trestle and off loaded into the blast furnace feed storage bins. Chunk barrings, barrings greater than four inches in size, will be recycled back into the furnace.

6.8.5 Refractory Material

Used refractory material is classified as a hazardous waste. When refractory is removed from service, it is stored in a hazardous material bin located south of the Change House. The bin is placarded on four sides and covered so that water cannot enter the bin and material cannot escape the bin. The bin is re-covered after material is added. The amount of material placed in the bin is recorded in a logbook located in the environmental office. Waste refractory material is shipped offsite prior to the 90-day hazardous waste generator storage limit. A licensed hazardous waste transporter hauls the waste refractory to a permitted hazardous waste disposal facility where the refractory is stabilized and landfilled in a Subtitle C landfill. Doe Run personnel will inspect the truck to make sure the container is covered and that the manifest has been completed and appropriate placards are in place.